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ABSTRACT

For centuries artists have explored the uses of color in their compositions. Believing that colors have innate symbolic, expressive, and aesthetic qualities, artists have been aware that these properties can be magnified or subdued by organization within a compositional space, and artists have suggested that certain positions within a framed field are inherently advantageous or disadvantageous for the placement of color. Recently, investigators in Gestalt psychology have identified a phenomenon called "magnetism of the frame." The theory suggests that a frame has powers of attraction, and objects placed close to an edge, either inside or outside the frame, will be perceived as drawn toward the frame. Other research has shown that certain sections within any framed space have the potential to sharpen the visual effects of any object placed within those sections. This paper explores the effects of magnetism of the frame on color. The possible areas of investigation, the variables of color and compositional field that need to be addressed and controlled, and media tools and stimuli that could be used to test hypotheses are outlined. The ramifications for applied mass communication are surveyed. It is theorized that a frame can supercharge colors. This phenomenon could be employed in television news delivery, publication, or packaging design. In addition, the fact that the placement of color within a frame is crucial to effective color photography composition is explored. (Author/CRH)

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VISUAL COMMUNICATION DIVISION

SUPERCHARGED COLOR:

Its Arresting Place in Visual Communication

By

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A paper and slide program for presentation to the Visual Communication Division, Association for Education in Journalism and Mass Communication, at the annual convention in Gainesville, Florida in August 1984.

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ABSTRACT

SUPERCHARGED COLOR:

Its Arresting Place in Visual Communication

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For centuries artists have explored the multitudinous uses of color in compositions. Believing that colors have innate symbolic, expressive and aesthetic qualities, artists have been keenly aware that these properties can be magnified or subdued by organizing colors carefully within a compositional space. A frame, in turn, delineates the boundaries of a compositional space, and artists have suggested that certain positions within a framed field of view are inherently advantageous or disadvantageous for the placement of color.

More recently, investigators in Gestalt psychology have identified a phenomenon called "magnetism of the frame." Developing a theory, they say that a frame has powers of attraction and that any objects placed close to an edge, either inside or outside the frame, seemingly will be drawn toward the frame, an application of psychological closure. Other researchers have discovered that certain sections within any framed space have the potential to sharpen the visual effects of any object placed within those sections.

This paper and slide presentation begin an exploration of the effects of magnetism of the frame on colors. They visually outline the possible areas of investigation, the variables of color and compositional field that need to be addressed and controlled, and offer depictions of media tools and stimuli that could be used to test hypotheses. After developing some hypotheses and suggesting some possible effects, the paper and slide program survey the ramifications for applied mass communication. A frame, it is argued, can "supercharge" colors. In turn, that phenomenon could be employed in television news delivery, publication or packaging design, and examples of those applications are offered. Last, the slide program shows how the placement of color within a frame is crucial to effective composition in color photography.

SUPERCHARGED COLOR:

Its Arresting Place in Visual Communication

The chameleon knows something about color that the peacock does not know. The use of color should be more selective than simply displaying color because it is available. Rather, the chameleon relies upon the knowledge that the right color in the right place at the right time is critically important.

Graphic designers and color photographers share something in common with both the chameleon and the peacock. Like the chameleon, visual designers must make deliberate choices in the use of color. Like the chameleon, they know that the use of color for simple ornamentation can be deadly. Like the peacock, however, graphic designers and color photographers often must use color to attract attention.

This paper and accompanying slide presentation explore the problem of "right color and right place." (Time, as a physical quantity, will not be included in the discussion. But timing as a reflection of successful exploitation of mass communication opportunities is inherent in the discourse.) The thesis of this offering is that a color in certain positions within a frame can be used for a number of communication purposes. In turn, this carefully placed color could be defined as "supercharged color." Its primary use could be to arrest a potential viewer, and that will be the main thrust of this argument. In the conclusion, however, questions regarding other possible uses and areas of investigation will be explored.

This, then, is essentially a descriptive paper. It combines research on frame effects with theories on the use of color from artists and aestheticians. It outlines an area for both empirical and critical study, indicates possible research tools and discusses the several variables. Because the author is

interested in the practical aspects of the problem, this paper and slide presentation also have an applied focus. Using the hypothesis that shapes of color have sharpened visual effects when placed close to the edge of a frame, the author will suggest how the phenomenon of supercharged color can be used in publication, advertising and packaging design, television news delivery, and as a compositional challenge in color photography.

A Frame: The Renaissance View

A frame is a boundary that encloses a compositional space. In turn, a frame can be formed in a variety of ways. Commonly, a frame is the border around a visual image. That border can be a matte, a mount board, a wall upon which a painting or photograph is hung, a television console, or even deep environmental space, sometimes called negative space, that surrounds an object. A frame, too, is created when two compositions come together and form an edge between them.

Traditionally, the idea of a frame is an inheritance from the Renaissance. Beginning with the 15th Century, painters envisioned a frame as a window on the world. Through it, a viewer could witness the unfolding of human events, much like a proscenium arch serves to frame the world within which actors tell their stories. In the Renaissance view a frame is the closest thing to the viewer. In fact, it serves as the viewer's initial reference point, her position in space. It represents the plane of fixed viewing. Correspondingly, many of the developments during the approximately 150 years of the Renaissance were a conscious effort on the part of painters to better understand and create the illusion of depth inside that frame. While Early Renaissance painters tended to cramp their figures all in the foreground, close to the frame, and disregarded the careful depiction of detail in the background, High Renaissance painters sought a more naturalistic rendition of space, with great depth beyond the frame being a clearly defined goal.[1] Linear and aerial perspective commonly

were used to create the illusion of three-dimensional space. But under no circumstances, according to the High Renaissance view, should the pictorial elements within the frame have any interaction with the frame itself.

More recently, visual communication theorists like Arnheim and Weismann grounded in Gestalt psychology have maintained that a frame encloses space, and within that space are certain forces, usually labeled either field forces or frame forces. They define visual experience as the active interplay of the viewer with the composition.[2] Rather than superimposing an individual set of compositional predilections, viewers of any composition tend to conform to the inherent structural forces within a compositional field. Also, these field forces are intuitive and are not consciously identified in the viewer's mind.[3] They are invisible, yet can be seen like magnetism can be seen. In turn, this structural skeleton of forces within the field can act as a stabilizing influence in the creation of a composition of lines, shapes and forms within that field. These field forces are usually pinpointed as the X/Y axes, diagonals drawn from the corners, and the golden sections, a set of axes that are intuitively scribed by viewers which divide space both horizontally and vertically in a 3:5 ratio. These forces represent a matrix of latent dynamism in a field of view.

Artists and aestheticians use a different nomenclature. Kepes, the artist and teacher, for instance, chooses to call these forces "patterns" and similarly suggests that viewing is an active process.[4] Although we tend to see a compositional artifact as an entity distinct from its surroundings, the frame serves to define and isolate the pattern of forces that directly and inextricably link the viewer with the field of composition. In this view the frame is a device the visual communicator uses to establish "a temporary boundary that both separates and connects the past and the future of the processes that trace it."[5] For Kepes the patterns are less distinct than the X/Y axes,

diagonals and golden sections. Structural forces in this theory are "patterned networks of sensation."[6] But both Kepes' theory and those of Arnheim and Weismann converge, however, in their insistence that field forces are latent and dynamic and only come into play when objects are placed, arranged, frozen or interact within a compositional field.

Arnheim calls these forces vectors of "directed tension," and says that organisms have a general tendency to resolve tension by unconsciously moving in the direction of the lowest attainable tension level.[7] Similarly, a visual communicator is encouraged to either use exaggerated tension for a deliberate reason, or, more likely, compose her pictorial elements so that the reduction of tension is the overriding concern. Weismann, too, borrows from the lexicon of Gestalt psychology and says that field forces are matrices along which there will be tension and closure.[8] An object placed within a compositional field will at one and the same time tend to move away from one edge of the frame, represented by tension, and toward enother edge of the frame, represented by closure. All parties in the investigation, the researchers like Arnheim and Weismann, and the artists and aestheticians like Kepes, agree that balance in a composition is achieved when these field forces of tension and closure are equalized. Also, ambiguity is injected into a composition when the object is placed in a position that seems to be near but not exactly on a latent field force.

> An unpleasant effect is produced by locations at which pulls are so equivocal and ambiguous that the eye cannot decide whether the object is pressing in any particular direction. Such wavering makes the visual statement unclear and interferes with the observer's perceptual judgment. In ambiguous situations the visual pattern ceases to determine what is seen, and subjective factors in the observer, such as his focus of attention or his preference for a particular direction, come into play.[9]

Using this idea of field forces, several researchers have explored the problem of whether or not certain positions within a frame have greater inherent

power, Niekamp found that the farther an object is from the center of a field, the more attractive force it exerts. Also, he suggested that the upper left quadrant seems to cause more initial fixations and sometimes the longest fixations. Last, he stated that the upper half of a field has inherently greater visual weight than the lower half, a finding that confirms Arnheim's theory.[10]

Using a semantic scale and testing respondents' reactions to an object placed within various sectors of a compositional field, Herbener, Van Tubergen and Whitlow determined that images are more active when the center of interest is higher in the frame, that images are more potent higher in the frame, and that there is an increase in tension as an object moves away from the geometric center, even if it is placed on an X or Y axis.[11] In turn, Arnheim maintains that a color will carry more weight if it is placed higher in a frame, reasoning that it takes more energy for an object to overcome gravity and rise.[12]

Frame Forces

In addition to field forces are other forces--frame forces. Whether these forces are a separate force or just one more field force is not too important here. But frame forces are just as evident and inherent as field forces, according to Arnheim and Weismann. They theorize that areas close to the edge of a frame, both inside and outside the frame and circumnavigating all perimeters of the frame, are "charged' areas. Objects placed close to the frame in these areas will be directly affected by the frame. They will be placed in a situation of tension and closure. The frame will tend to draw the object away from the geometric center of the field and toward the frame itself. This phenomenon is called "magnetism of the frame," and Weismann suggests that it represents psychological closure, that the object tries to attain the lowest level of tension by gravitating toward the dominant force, the edge of the frame.[13]

Zettl, who also encourages the recognition of frame forces, suggests that magnetism of the frame is strongest when an object is placed in the corner of a field, the rationale being that in that position two edges of a frame are simultaneously working on the object.[14]

In most experiments testing the effects of frame magnetism, investigators used a round disk as the object.[15] The rationale is that a circle is the least interactive shape with a frame, which is usually formed by two straight lines coming together at right angles. Squares and rectangles typically are not used as shapes because they may be strongly attracted by the frame because of their geometric peculiarities. For instance, a square may seem to be attracted by the edge of a frame, not because of the inherent magnetic force of the frame, but because of similarity; i.e. both frame and shape share qualities of having straight lines and right angles. Moreover, if that square is oriented in such a way to the frame that its sides are parallel to the edges of the frame, then the similarity struck by parallelsim would cause an attraction of shape to frame, and not because the frame by itself has a power of attraction.

A triangle, too, can pose the same interactive problems. A right triangle, if it is tucked into a corner near a frame with its hypotenuse facing the geometric center of the field, seems to combine with the frame because its base sides and 90 degree angle are similar to the same structures found in the corner of the frame, and our brains group those similarities. If, however, the right triangle is reoriented in space so that its hypotenuse faces the corner of the frame, then it has less interaction with the frame because those structural similarities of common angle and extending sides are not as obvious.[16]

The artist and aesthetician Faber Birren argues that triangles and squares are easier to perceive and orient in space than is a circle or sphere, probably because the circle lacks sharpness and is not easy for the eye to

focus on.[17] Arnheim says that a circle tends to be an isolated shape in any composition because it does not fit easily into a context, since most of our natural forms and shapes include angles.[18] A circle, then, is potentially the least interactive shape with a frame. It shares nothing in common with the usually rectangular frame, neither angle nor line, so shape can be somewhat eliminated as a variable in testing the effects of frame magnetism on objects placed in charged areas.

In past investigations measuring the effects of frame magnetism effects on objects, a black disk was used, the reasoning being that color would add still another variable. Yet in most mass media, objects within a composition possess color attributes as well as point, line, shape, tone, texture or form. While a circle may be harder for the eye to focus on than a square or triangle, it also may be true that the choice of hues for object and background may influence the legibility of shapes. Colors have synesthetic qualities whereby there are common involuntary sensations in observers to color combinations in addition to the regular sensations that they experience when seeing a color.[19] For instance, warm colors tend to advance to the foreground while cool colors recede. So, a warm colored circle against a cool colored background would tend to advance to the foreground, separating the circle from its background and therefore making it more legible and easily focused on.

Shape and color, then, may complement each other and combine within an object, or they may clash and appear as separate qualities. Arnheim argues that a shape is a better means of identification of a thing than a color because a shape has more qualitative differences and because a color is more influenced by environmental conditions, the color of the incident light, for example.[20] Schachtel goes farther and maintains that the experience of color is a passive experience and resembles that of affect or emotion:

> Emotion strikes us as color does. Shape, by contrast, seems to require a more active response. We scan the object, establish its structural skeleton, relate the parts to the whole... Broadly speaking, in color vision action issues from the object and affects the person; but for the perception of shape the organizing mind goes out to the object.[21]

Arnheim is less categorical and says this is only a tendency. Shape can be expressive, and color can have a tectonic structure like shape.[22]

Attributes of Color

Hue is one of the variables of color. Brightness or value and chroma are the other inherent variables. But as noted above, it is also difficult to separate the variables of color from the other surrounding phenomena which may influence the perception of color hue, value or chroma. Shape is one of those variables. So too are line, three-dimensional form, the content or "thingness" of the visual stimuli or composition, and the context in which the "thing" is perceived. Last, the position of that color within the frame or compositional field is still another variable of color perception.

It would be comforting if all these variables would somehow always combine into a perceptual meaning that could be ensured in all audiences. But even if shape, line, specific content and context could be quantified and exact cultural meanings attached, color is resistant to such labeling. All we know is that culturally shared meanings and color preferences are too culture-specific and time-specific to be of definitive help.

But symbolic meanings of color often seem to have more universal connotations.[23] Kohler and Arnheim argue that this is because colors have innate qualities, and symbolic meanings of color are qualities of color, just as saturation or hue.[24] Jung agrees and says the universal acceptance of symbolic meanings of color is due to psychological "archetypes" or "primordial images" that are inherited.[25] In this nativistic approach, "To perceive colors at all entails automatically the perception of the expressive qualities of colors...

The perception of expression is innate and most natural, while what needs explanation is the matter-of-fact perception, which is a late development and certainly stands in need of explanation."[26]

The color red, for instance, seems to have strong cross-cultural, symbolic connotations. According to Kreitler and Kreitler, red is universally interpreted as exciting, stimulating, powerful, strong, vigorous, masterful, energetic, impulsive, and gay with a note of aggression.[27] It also signals danger.

Kreitler and Kreitler also suggest that described meanings of colors include dimensions of meaning. Blue, for instance, can be interpreted on different levels:

> These are meaning in terms of bodily expression, e.g., blue constricts bodily movements; in terms of sensations and feelings, e.g., blue is a cold color; in terms of general abstract interpretations, e.g., blue denotes spirituality; in terms of metaphors based on resemblance in the characteristics of the color and the meaning, e.g., blue is like the world beyond; and finally, meaning expressed in terms of what could be called true symbols, whereby the color comes to represent a contrast and its solution, e.g., blue denotes the fusion of heavenly peace and the destructive fire of lightning.[29]

Red: The Potential Best Choice for Testing

A fully saturated, bright red hue would appear to be the best hue to use to test the effects of magnetism of the frame on colors. Besides its seemingly shared, cross-cultural connotations, red is the predominant color used in most languages. In their anthropological research from 20 languages, Berlin and Kay found that, "When a language contains a third color name (other than dark or light), it is always red. This new category absorbs the red and oranges and most yellows, pinks and purples, including violet. The remainder is divided between darkness and lightness."[30]

Red also is a strongly preferred color regardless of age or nationality. In most tests it continues to place second only to blue, sometimes, in preference.[31] Perhaps because of this universal preference, and perhaps because of its abundance

in nature for use as a pigment, red is a familiar color, and its attributes, then, would be less likely to intervene on a conscious level with a viewer's perception of the color when it is placed close to the edge of a frame.

Red is an irreducible element. For painters it is a fundamental primary. Although in the subtractive process of color printing it is treated as a secondary primary, red still is a standard that is used to determine if the filtering action of certain densities of inks or dyes is life-like and accurate in the reproduction of the original. And although it is only a theory, the tri-color theory of white light, where red is a fundamental light primary with blue and green, is widely accepted as the most plausible of the various theories.[32]

Any study of the effects of magnetism of the frame on colors has to take into consideration the context of color of object against color of background. Red, in turn, provides some advantages in this area. An initial experiment should seek to minimize the context of background color by using white as a backdrop. Red on white is viewed as a highly legible color combination.[33] Moreover, the eye has an excellent acuity for red as a point source under dim light.[34]

Of course, supermarket packagers and fire engine designers are well aware of the high visibility of red and other warm colors like lime-yellows and oranges. In fact, point of sale merchandisers rely strongly on the visibility of warm colors as fundamental parts of their marketing plans. This high visibility of red also would provide benefits in any experimentation focusing on frame magnetism effects. In addition to the fact that the increased visibility of red aids the quick location of the hue in a compositional field, warm colors possess the already mentioned synesthetic quality of advancing to the foreground. In turn, this phenomenon suggests interesting possibilities for research.

Consider again the Renaissance view, that visual elements should not interact with the frame. By having the tendency to advance to the foreground, red would have a greater chance of interacting with the frame, or at least would be psychologically "close enough" for the frame to actively affect a passive red object.

The Hypothetical Effects of Frame Magnetism on Color

Of course, a frame really cannot magnetize a color or object in a real, physical sense. It is only a metaphor, but a helpful one, in explaining certain visual phenomena. Continuing the line of reasoning regarding magnetism of the frame initiated by Arnheim, Weismann and Zettl, however, it is equally illustrative to use the classical physical descriptions of magnetism and electromagnetic wave action to explain the hypothetical effects of frame magnetism on color.

Magnetism is a product of the movement of electrons in shells within atoms. Each electron in an atom has a charge, but because the individual electron movements are random, the charges tend to neutralize each other and most substances do not have an identifiable charge or potential to attract. When objects are placed within a magnetic field, however, electron opposites called dipoles tend to align themselves in the same direction, toward the magnetic power. Elements like iron that have more dipoles are more easily magnetized. Eventually, these clumped "vectors" of magnetic domains become totally in alignment with the magnet. Then, the object has north and south poles. It is magnetized or "polarized."

If a color is placed close enough to the edge of a frame so that it falls within the magnetic field of the frame, it, too, should be similarly, descriptively affected. It would tend to gravitate toward the magnet, the frame. But that color really does not "move," so there must be some other form of energy displacement. It can be suggested, then, that the color itself

becomes polarized, although not "polarized" in the physical sense that its light waves vibrate only in certain planes. Instead of possessing identifiable north and south poles like a piece of magnetized iron, that magnetized color would tend to possess more energy. It would become "supercharged."

But this would not necessarily illustrate how that supercharging or increased energy is converted into perceptual energy. The color itself may have a higher degree of energy placed next to a frame, but how does a viewer perceive that heightened radiant energy? That illustration lies in the coordinate theory of electromagnetic wave action.

We know that magnetism and electromagnetic energy are closely related. For instance, if a magnetic field passes over a wire, it will cause an electrical current to pass along that wire. But more important, physicists know that electromagnetic waves move perpendicularly to the alignment of magnetic domains that we call magnetism. In turn, visible light is a group of electromagnetic light waves and frequencies. The visible spectrum begins with red, the color with the longest wave frequencies and lengths.[35]

Now, we have a way of illustrating how the increased energy from supercharging is perceived by a viewer. Once a color is magnetized or polarized by a frame, it would have its own magnetic field or alignment. That magnetic field, in effect, is a vector that squares with the edge of the frame. Conceive, then, of the frame and color as being one, flat plane. Perpendicular to that plane, and moving toward the viewer in three-dimensional space, would be the vector of electromagnetic energy caused by the magnetism.

Any color already reflects a certain portion of the incident electromagnetic energy that falls upon it. By the very fact that one perceives a color at all indicates that there is a perceptual path from the color to the viewer. In turn, the increased radiant energy due to the magnetic supercharging of the color is added to that already present perceptual vector. The only

difference is that the supercharging radiates from the color itself. It is not reflected from the incident light. But the viewer cannot distinguish between the two. She perceives the color close to the edge of the frame as a more powerful color.

It can be hypothesized that that supercharged color would cause tension in the viewer. In turn, that tension could be used for visual arrest, to attract attention. Also, it is a tension that could be manipulated. We can hypothesize that the explicit tension could be mediated and controlled by placing that supercharged color on one of the inherent field forces that are believed to possess a measure of stability and equanimity, a golden section for instance. So, the supercharged color need not be wholly tense and disturbing, a simplistic exercise in unrequited shock or abrasion. Rather, the energy of the supercharged color could be harnessed for controlled visual communication purposes.

It also can be hypothesized that the other variables of color, as well as the other compositional variables of line, shape, form, content and context, would have some influence on the degree of supercharging and the transference of that increased energy to the perceiver. For instance, a background color other than white probably would cause slightly different perceptual effects. A red circle on a green background, a complementary color combination using the artist's color wheel, might tend to increase the radiant energy because the red circle would tend to advance further away from the background color and toward the foreground, more so than with a bright, white background, causing a greater potential for the red circle to interact with the plane of the frame.

In an analogous color scheme, on the other hand, a red circle on an orange background of equal brightness and saturation probably would lose much of its supercharged effects. The red circle would be less visible to the viewer

against an orange background. Therefore, the attractive powers of the frame would have less to work on. Moreover, the frame itself would tend to become less important in such a situation, because the overwhelming synesthesia of advancing warm colors across the entire compositional field, might cause the colors to move pass the frame and form a new plane closer to the viewer.

A Call for Experimentation

This paper and slide presentation outline a potential area of study. Perhaps, following the line of argument, the reader already has devised an experiment to test the hypotheses above. Certainly, an acceptable approach would be to use the methodology devised by Herbener, Van Tubergen and Whitlow whereby they offered their subjects six framed visual stimuli in random order and then asked them to indicate their feelings prompted by each stimulus on a series of five-point semantic differential scales. In each case a tone circle of 22-line, 30% screen, was used. The circle was offered at six different positions, representing six different sections of a compositional field. Also, the investigators chose the six different positions for the tone circle so as to represent the vertical axis, a diagonal axis, and one horizontally off-center position.[36]

An experiment testing the effects of frame magnetism on color would need to substitute a red colored circle for the black tone circle. However, as Herbener, Van Tubergen and Whitlow suggested in retrospect, other positions should be added in order to test the power of the frame in different areas inside the rectangle, despite their concern for monotony on the subjects. Those added positions should include the placement of the red circle in magnetized positions on golden sections.

In order to test the hypothesis that supercharged color would cause tension in the viewer, the subjects could be asked to respond to the semantic differential activity factor by using the tense-relaxed bipolar pair. Later

or more thorough experiments could test response to other factors such as the evaluative factor with a pleasant-unpleasant bipolar pair, the stylistic factor with an exciting-dull bipolar pair, and the potency factor with a bold-timid bipolar pair. At this point it would seem unproductive to test the ethical factor with a fair-unfair bipolar pair, since a color without a surrounding context would not necessarily stimulate an ethical reaction. However, it is not inconceivable that that factor could be measured in the context of television news delivery, with the anchor adopting different colored handkerchiefs that are framed in such a way that they are magnetized by the television frame.

The new personal computers offer still another methodological alternative and a way to alleviate some of the problems of researcher/observer involvement. Consider the possibility of employing a user friendly computer with a mouse and a graphics program with a color component. Rather than mechanically offering a subject a fixed set of visual stimuli, which would tend to make the subject a passive consumer, each subject could be instructed to use the computer's mouse to move around a red circle until she finds a position on the television screen where the circle appears to her to have the greatest tension.

This research outline conspicuously avoids the testing of factors other than the activity factor, for the overriding reason that most interpretations of the meanings of certain colors are individualistic, time-specific and culture-specific. Only those symbolic interpretations due to the so-called innate qualities of colors seem to bridge time and tribe. Yet, it would certainly be important and instructive to know if the color red, besides creating more tension, seems more arresting, more exciting, more powerful, more masterful, more impulsive and/or more dangerous if it were placed in a supercharged position within a frame.

If these possibilities can be proven, it also may be fruitful to explore other questions that are fundamental to the area of study:

--Does supercharging a color generate new interpretations or additional dimensions of meaning different from the innate, archetypal meanings?

--The size of a shape of color is a variable in color composition. To what extent, then, would size negate the effects of frame magnetism, and subsequently, supercharging? How large must a colored shape be before it begins to take on a life of its own, where it no longer is subordinate to and affected by the edge of the frame, where it possesses enough visual mass that its magnetic, gravitational power are greater than that of the frame?

--Certain shapes have psychological meanings already attached to them. For instance, a square often is interpreted as being static and boring. A circle suggests composure. If shapes are placed within the magnetic field of a frame, are those psychological meanings similarly affected? If an object has a shared psychological meaning, such as a cross for Christians, is its inherent meaning sharpened if it becomes magnetized? In turn, if a color is added to either that shape or object in a magnetized position, are new interpretations created that can be said to be shared?

--A composition needs a certain amount of richness to involve the viewer and prevent her from becoming bored. For that reason supercharged color alone cannot be expected to offer too much in the way of composition. It must function with other compositional elements, and a design or good Gestalt relies on the interdependence of all compositional elements present. Correspondingly, it is necessary to know to what extent supercharged

color can fit into a composition; to what extent it can be used as a structural tool. Would a supercharged color lessen the physical attributes of shape, if that colored shape were placed close to the edge of a frame? Would a supercharged color necessarily overpower line, contrast, and/or texture? Would the inclusion of a supercharged color in a composition overpower the content? Would it add a sense of unreality to some contents?

--In terms of composition, form usually is defined as being a shape with a coordinate quality of volume or three-dimensionality. A cube, for instance, can be rendered as a three-dimensional object on a two-dimensional surface by using perspective and isometric projection. Would that sense of three-dimensionality by increased if the cube were overprinted in a color? Would that colored cube be perceived as being even more lifelike, more three-dimensional if it were placed in a supercharged position near the edge of a frame? Or, if that cube were overprinted with a warm color, would the sense of three-dimensionality be leveled and lessened if it were placed close to the edge of a frame, where the color, already synesthetically advancing to the foreground, would meet the plane of the frame, thus fostering a two-dimensional perception again?

--The possibility of supercharging some colors in a composition, but not others, would necessitate further studies on how colors function in compositions. For instance, would supercharging a cool, debased color by placing it in a field of frame magnetism in an upper left corner cause it to have more visual drawing power than a bright, warm color that is placed in a less dynamic position, perhaps on the vertical axis below center?

--Color is a powerful, flambuoyant, often distracting compositional element. Often, it is treated as pure ornament and is used without the necessary previsualization of intentions and meanings. For this reason, many photographers neglect color photography and choose to labor in the "purer" form of black-and-white photography where color is not all-powerful and need be treated only as a light value. In a similar vein, others argue that color is a misused element in photo-journalism. Sometimes, a photo editor is placed in the awkward position of having to decide against the use of a color original in favor of a black-and-white rendition, since the color original is misleading because the colors used, although realistic, conjure up the wrong mood in the viewer. They interfere with the proper interpretation of the news event.

Possibly, supercharged color could be used by a photo editor to more accurately control the perception of the visual. Besides choosing a color for its mood, the photo editor could use it in combination with a black-and-white halftone to increase the reliability of the communication. For instance, instead of using the second color in a duotone, would a black-and-white halftone placed next to a supercharged color "borrow" from or interact with the increased radiant energy so that the super-charged spot color and the black-and-white image combine to create a single expression?

--If it can be shown that a supercharged color arrests attention, then it would be instructive to see how that phenomenon affects visual information processing. For instance, could a supercharged color be used "ahead of" an illustration to attract attention and/or to isolate a particular audience or market cluster? In other words is a supercharged color perceived before any other graphic elements in a composition? If so, how are the rest of the graphic elements sequentially perceived in

relationship to that initial visual arrest? Practically, would a headline or title placed close to a spot of supercharged color near the edge of a frame have the equivalent drawing power of a four-color illustration, yet at a much reduced reproduction cost to the client?

Practical Applications and Limitations

One moves from the theoretical to the practical with obvious trepidation. There is comfort and solace in the atmosphere of the bell jar, when one can isolate or eliminate many of the variables and focus attention on a single event. But supercharged color, if the phenomenon exists, inevitably must function in the real world. As the corollary questions just discussed indicate, supercharged color would have to be able to work with other color and compositional variables. In many cases supercharged color simply may be an irritant or detractor from the composition that the designer wishes to avoid. But even if that could be known with surety, we would have added something of importance to the developing alphabet of visual communication symbols. However, there is an equally strong possibility that supercharged color could provide some advantages in practicing and teaching visual communication.

The accompanying slide presentation attempts to develop many of the concepts verbally described in this paper. It offers visual examples of current theory regarding magnetism of the frame. It also provides models of visual stimuli that could be used to test the hypotheses discussed regarding placing a color close to the edge of a frame.

But, as mentioned in the introduction, the author is most interested in applied visual communication. So, the slide presentation also "jumps the gun" somewhat. Instead of following the usually prescribed route, instead of first reporting on the testing and informing practitioners of the abstract principles discovered, the slide presentation offers examples of what the

hypothesized uses of the theory could be. The slide presentation admittedly offers practical applications before the empirical results are known. Hopefully, however, the visual examples will display an a priori power. If the theories are correct, the effects should be noticeable in the practical artifacts offered.

The slide examples touch upon several areas of visual communication. Applications and attendant problems will be demonstrated for television news delivery, for publication, advertising and packaging design, and for color photography. Also, the visual examples necessarily show the advantages and disadvantages for two different methods of creation. Adapting the principle of supercharged color is a different exercise in graphic design, where the designer is faced with a "tabula rasa" and a universe of possibilities, albeit possibilities limited by the demands of the communicator and audience. In color landscape photography and photojournalism, and in similar situations where the composition must be "found" and only can be minimally constructed, the challenge of using supercharged color is different.

Some artists and color photographers say that under no circumstances should an individual color accent be placed in a corner or too close to the edge of the frame, maintaining that by drawing attention to itself, it will necessarily detract from the rest of the composition. Instead, they suggest that the ideal positions in a composition for a color accent are at the center or at the harmonious points of the golden sections.[37] Indeed, it may be that supercharged color is something to be absolutely avoided in color photography, and that possibility is explored in the slide examples.

But, the need to make a picture, the need to create a composition that communicates the photographer's intentions and that can be understood by the audience is really the only context that needs to be considered in evaluating the compositional uses of supercharged color in color photography. Absolute

restrictions suggest a rigid, art for art's sake approach. That is an important consideration in visual communication, but communicated effect is paramount in artifacts designed for mass consumption. Tension, in turn, may be a desired effect in certain circumstances. Pop psychology aside, tension may represent a positive value. In those circumstances, supercharged color is an arresting idea.

NOTES AND REFERENCES

[1]Heinrich Wölflin, The Art of the Italian Renaissance (New York: Schocken Books, 1963), p. 249.

[2]Rudolph Arnheim, Art and Visual Perception (Berkeley: University of California Press, 1974), p. 11.

[3]Donald L. Weismann, The Visual Arts as Human Experience (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1974), p. 102.

[4]Gyorgy Kepes, The New Landscape in Art and Science (Chicago: Paul Theobald and Co., 1956), p. 205.

[5]Ibid.

[6]Gyorgy Kepes, ed., Structure in Art and in Science, Vision + Value Series, (New York: George Braziller, 1965), p. iii.

[7]Arnheim, p. 14.

[8]Weismann, p. 103.

[9]Arnheim, p. 14.

[10]Walter Niekamp, "An Exploratory Investigation into Factors Affecting Visual Balance," Education and Communication Technology Journal 29 (Spring 1981):45.

[11]Gerald F. Herbener, G. Norman Van Tubergen, and S. Scott Whitlow, "Dynamics of the Frame in Visual Composition," Education and Communication Technology Journal 27 (Summer 1979):87-88.

[12]Arnheim, p. 30.

[13]Weismann, p. 103.

[14]Herbert Zettl, Sight, Sound, Motion: Applied Media Aesthetics (Belmont, California: Wadsworth Publishing Co., 1973), p. 18.

[15]One of the perplexing problems in the investigation of frame magnetism effects is trying to eliminate or control some of the variables. For instance, except for points and lines, something that can be seen has a shape. Moreover, that positive, manifested shape may form a negative shape with which it must necessarily interact, like yin and yang. Gestalt researchers call this relationship a "figure-ground relationship." To complicate matters, shapes also tend to have inherent meanings, given to them over time by "cultural story telling." Even if an investigator were to try to eliminate the effects of shape on frame magnetism by choosing an irregular shape for testing, theorizing that a shape that has no regularity of line or angle or which has no accepted

meaning will be the least interactive, that line of reasoning would be countermanded by the research findings that suggest that irregular contours tend to have more visibility than regular contours because of their notoriety.

[16]Still another variable that is part of the shape/frame quandary that is difficult to totally control is the visual vector. For instance, triangles with two equal angles necessarily become a pointer. In the case of the right triangle, the "pointing" proceeds from the hypotenuse toward and through the right angle. So, a shape, besides being potentially interactive with a frame because of shape attributes, may also interact with a frame, or the remaining composition, simply because of how it is oriented in space and where it points.

[17]Faber Birren, Color, Form and Space (New York: Reinhold Puolishing Corp., 1961), p. 18.

[18]Arnheim, pp. 360-61.

[19]Hans Kreitler and Shulamith Kreitler, Psychology of the Arts (Durham, North Carolina: Duke University Press, 1972), p. 70.

[20]Arnheim, p. 333.

[21]In Arnheim, p. 333.

[22]Arnheim, p. 334.

[23]Kreitler and Kreitler, pp. 67-68.

[24]Arnheim, p. 416.

[25]Carl G. Jung, ed., Man and His Symbols (New York: Dell Books, 1969), p. 57.

[26]Kreitler and Kreitler, p. 71.

[27]Ibid., pp. 67-68.

[28]In The Naked Ape Desmond Morris suggests that these archetypal connotations are due to certain mutually shared experiences concerning the color red. Red seems exciting, stimulating, masterful and impulsive because it is the color of flushed sexual organs. Perhaps danger, too, is associated with that experience.

[29]Kreitler and Kreitler, p. 69.

[30]Brent Berlin and Paul Kay, in Arnheim, p. 331.

[31]Birren, p. 75.

[32]Another theory of color vision is sometimes called the "degree of redness" theory. This theory posits the hypothesis that color perception is a mixture of different retinal sensitivities to the color red and to lightness and darkness. When a viewer perceives another hue, green for instance, that perception really is a product of sensing a certain amount of reflected red

light from an object, coupled with a coordinate sensation of lightness or darkness.

[33]Birren, p. 45.

[34]Ibid.

[35]A troublesome, but not destructive, corollary is that the color red, having the longest wave frequency in the visible spectrum, has the fewest number of electromagnetic oscillations. This would suggest that it has less potential energy, if potential energy is a measure of oscillations and wave movement. In fact, all warm colors, those so-called more visible and compositionally more active colors, would have less potential energy than would the cool colors, those so-called passive colors, which have shorter electromagnetic frequencies and subsequently more oscillations.

[36]Herbener, Van Tubergen, and Whitlow, p. 85.

[37]Harold Mante, Color Design in Photography (New York: Van Nostrand Reinhold Co., 1972), p. 50.